

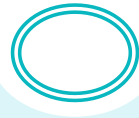
Where to Begin?



DEVELOPING & LEVERAGING NOVICE USERS

MELISSA HILL, MPH
JULIE KEZIK, MS

About us...



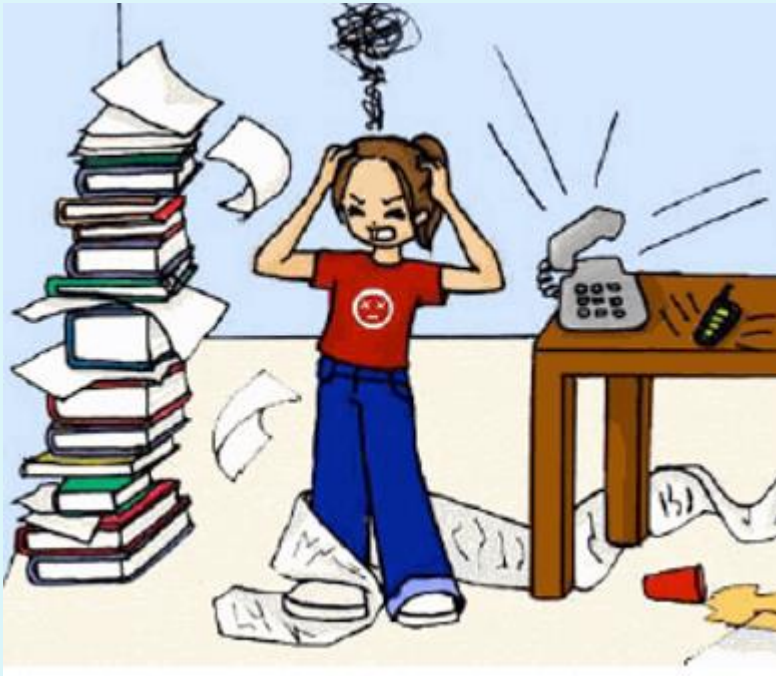
- Melissa Hill is a Clinical Programmer at Cd3 Inc.
- Julie Kezik is a Biostatistician at the Yale Center for Perinatal, Pediatric and Environmental Epidemiology (CPPEE)
- We met in 2007 at the CPPEE as Field Supervisor and Research Assistant.
- In the last 9 years we have each held a handful of positions, using SAS to perform a multitude of functions.
- We have a combined 18 years of SAS programming experience

How this all started



- In 2012, our data management team included :
 - Data Manager
 - Research Associate
 - SAS Programmer/Analysts
 - Biostatistician
 - Research Scientist
 - **MS Access Programmer**
 - **Research Assistants**
- Our support staff, although fabulous for their attention to detail and patience with meticulous tasks where not fluent in SAS.

Problem is...



- Support staff needed data to do their work
 - Lists & Output
 - Programs re-run to update data
- Programmers were required to break from their own tasks and create these materials

Bigger Problem is...



- The obvious solution was to educate our team

BUT...

- We could not find a training program that met our specific needs
 - Available resources were either: expensive, time consuming, or too statistically driven
-
- We developed and initiated our own SAS training program!

Solution



Spending structured time with employees while they explored SAS was the most economical way for us to teach basic users the skills they need to complete daily tasks.



Since training our own staff, we have experienced increased productivity by an empowered and independent support team!

Sharing our Success...

... 2013

SAS® Essentials: Maximize the Efficiency of Your Most Basic Users

Julie Kezik MS , Melissa Hill MPH
Yale University

Introduction

If programming and research assistants were taught SAS essentials, job efficiency could be maximized with the ability to use SAS as a tool to do their own preparatory work for assigned tasks. This paper summarizes a supplemental training program which teaches basic SAS programming skills to enable support staff to be more independent.

The purpose of this seminar is not only to teach how to do things, but also to provide a toolkit of essentials for new and infrequent users. Spending time with your employees while they explore SAS is the most economical way to teach basic users the skills they need to complete daily tasks. The ability to navigate various windows allows your novice user to be knowledgeable about their data. As new data sets are created they can be checked and errors detected within reasonable time frames.

Course Outline

1. Navigation
 - Editor
 - Log
 - Results
 - Explorer
 - View Table
2. Import Procedures
 - Import Wizard
 - Alternatives in JMP®
3. Data Exploration
 - Using the Explorer
 - PROC CONTENTS
4. Data Step
 - Types of datasets
 - Storage of datasets
5. Reading the Log
 - Note
 - Error
 - Warning
6. Procedures
 - PROC SORT
 - PROC PRINT
 - PROC FREQ
 - PROC MEANS

1. **Navigation** – maximize efficiency by utilizing the simple tools SAS provides upon opening the product



2. **Import Procedures** - is an easy and efficient way of putting external data into a SAS dataset.



3. **Data Exploration** - The best way to become familiar with a foreign dataset is to begin with a PROC CONTENTS.

```
PROC CONTENTS DATA = 'Z:\practice1'; RUN;
```

4. **Data Step** - Data steps are written by the programmer and are utilized to create new data sets of two kinds: temporary and permanent.

```
Temporary:
DATA Y; SET X ;RUN;

Permanent:
LIBNAME X 'Z:\JRMH\SAS 2013\data';
DATA X.PRACTICE1;SET XYZ; RUN;
```

5. **Reading the Log** - The log is documentation of everything you have done during your SAS session.

```
NOTE: There were 250 observations read from the data set WORK.X.
ERROR: File WORK.XYZ.DATA does not exist.
WARNING: Data set X.PRACTICE1 was not replaced because this step was stopped.
```

6. **Procedures** – Allows the user to manipulate and view data in many ways.

PROC SORT
Orders a data set by the value of variables listed in the BY statement.

```
PROC SORT DATA = X; BY ID TOWN; RUN;
```

Missing First	INDOOR NO2 MEASUREMENT (PPB)	TOWN	STOVE_TYPE	Address #	ALLEYWAY	ID
1	1	14902796 New Haven	1	1	1	481154
2	2	48022076 New Haven	1	1	1	481155
3	3	52020585 New Haven	1	1	1	481156
4	4	63607047 New Haven	1	1	1	481157
5	1	74608880 Stamford	1	1	1	481158
6	2	10104855 Stamford	1	1	1	481159
7	3	20307826 Stamford	2	2	1	481160
8	4	40760705 Stamford	2	2	1	481161

PROC FREQ
Creates multi-way crosstabs or cross-listings of variables listed in the TABLES statement.

```
PROC FREQ DATA = X; TABLES STOVE_TYPE; RUN;
```

The FREQ Procedure				
STOVE_TYPE	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	142	52.26	142	52.26
2	108	42.74	250	100.00
Frequency Missing = 2				

Summary

The SAS slogan is 'the power to know.' When working in SAS it is important to remember that there are many 'right' ways to complete a task. SAS programming is a creative and iterative process designed to empower the user. One's personal style evolves over time. How to solve a data mystery or accomplish a data driven task is ultimately an independent decision made by the user.

The SAS Essentials training program is an easy course to implement for those who want their support staff to succeed and excel at interpreting, processing and summarizing data. Blending the idea of efficiency, empowerment and ultimately self-management is an opportunity for supervisors to fully utilize the time of all their staff and create a successful and productive team.

PROC PRINT
'Prints' the contents of the specified dataset in the output window; options allow the user to change the visual appearance.

```
PROC PRINT DATA = X D LABEL; ID ID; BY TOWN; RUN;
```

TOWN=Stamford					
ID	INDOOR NO2 MEASUREMENT (PPB)	STOVE_TYPE	Address #	ALLEYWAY	Address #
481154	1	4.29465	1	1	0
TOWN=New Haven					
ID	INDOOR NO2 MEASUREMENT (PPB)	STOVE_TYPE	Address #	ALLEYWAY	Address #
481155	1	10.1999	1	1	0
481156	2	6.9355	1	1	0

PROC MEANS
Provides number of observations and calculates descriptive statistics such as mean and standard deviation.

```
PROC MEANS DATA = X; VAR PPB_IN; RUN;
```

The MEANS Procedure					
Analysis Variable : PPB_IN INDOOR NO2 MEASUREMENT (PPB)					
N	Mean	Std Dev	Minimum	Maximum	
250	8.4937965	6.1961535	1.4260183	48.7064783	

Yale SCHOOL OF PUBLIC HEALTH



Sharing our Success...

... 2014

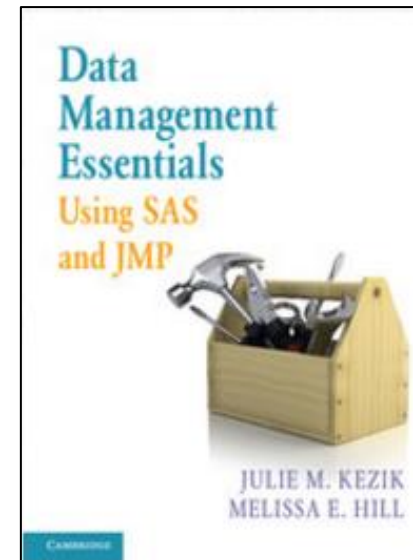
“SAS Essentials”

- A two day course Presented at Yale
- Audience included Staff on lay off status looking to expand knowledge to further their experience and job pool at the University.
- Students learned to:
 - ✦ Recognize and use most basic SAS tools.
 - ✦ Understand how datasets are stored, viewed and created
 - ✦ Use elementary variable manipulation techniques
 - ✦ Simply display and summarize data independently
 - ✦ Create output
 - ✦ Understand how to use course documentation as a reference.

Sharing our Success...

... 2016

- Each time we presented our ideas it was clear that others were interested
- This inspired us to find a more widespread platform from which to share our success



Challenges



- Why is this different from what already exists?
- Who is going to use it?

Challenges



Why this is different from what already exists?

- ‘Cliff’s Notes’ or handbook for the first time or one time user who seeks IMMEDIATE applicability.
- A guide on how to get started
- Focus is not on statistics

Challenges



Who is going to use it?

- Students. Constantly they walk in with a project and are handed data – but have never explored SAS.
- Employees providing coverage for a full time programmer
- Researchers who are often sent data in SAS datasets, basic needs are to view and interpret.
- Supervisors can use this for their own support team
- Anyone interested in a hands on approach to teaching themselves

What is our method?



Navigation & Exploration

Common Syntax and Simple PROCs

Simple Statistics & Displaying Data

Navigation & Exploration



- Navigate and utilize SAS windows and work areas
- Understand how SAS stores and references data
- Develop a working knowledge of the unique characteristics and components of a SAS dataset and its variables

Common Syntax and Simple PROCs



- The DATA Step
- Simple PROCs
 - Contents
 - Sort
 - Print

Simple Statistics & Displaying Data



Focus on Reporting for Data Cleaning/Operational Monitoring

- Identifying missing values
- Frequencies and Crosstabs
- Plots and Charts

How our method evolved ...



- Hands-on practice exercises and solutions
- BASE SAS is not for everyone
 - Enterprise Guide is used by many people and can be a great option for the novice user
 - JMP is a great alternative for data visualization, especially for novice users.

What we learned...



- Writing and publishing a book is not easy, quick or immediately profitable
- There is value in teaching the simple things

But...

... the snowball affect is a real thing

Questions?